9.2574
9.2582

S/033/61/038/002/008/011
E032/E414

AUTHOR: Konstantinov, A.I.

TITLE: An Investigation of the Molecular Frequency Generator of the Khar'kov State Institute for Measures and Measuring Instruments (KhGIMIP) and its Use in the Time and Frequency Service

PERIODICAL: Astronomicheskiy zhurnal, 1961, Vol.38, No.2, pp.361-372

TEXT: The maser developed by A.Ya.Leykin (Ref.1) has been in continuous operation at the above Institute since March 1958. The maser employs an ammonia beam and its frequency stability is of the order of $\pm 3 \times 10^{-10}$ (relative root mean square error). This figure was estimated by A.Ya.Leykin in Ref.1. Since April 1959, the Khar'kov molecular generator has been continuously compared with four quartz generators KX1 (KKh1), KX2 (KKh2), KX3 (KKh3) and KX4 (KKh4) which in turn are compared with each other by the method of beats using a quartz resonator at 60 kc/s. These comparisons have lead to four series of corrections to KKh3 relative to the maser. The first series was obtained by direct

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comparisons of KKh3 with the maser while the three other series were obtained from comparison of KKh3 with KKh1, KKh2 and KKh4 which in turn were compared with the maser. Assuming that the difference in the corrections is largely due to a nonlinear variation in the frequency of the generators and the latter can be characterized by a root mean square variation in the diurnal rate of the clocks, it was found that the relation between the error in the correction relative to the maser and the root mean square variation in the clock rate is

$$\Delta f = \pm \delta\sqrt{t - t_o}$$

The root mean square variations in the diurnal rate for the clocks KKh1, KKh2, KKh3 and KKh4 during the period under investigation (March 1958 - March 1959) were found to be

$$\Delta f = \pm 2\sqrt{T - T_o}$$

This result is in agreement with the results reported by J.P.Blaser in Ref.2. In order to investigate the frequency stability of the

above maser, a determination was made of its frequency between March 1958 and March 1960 relative to the standard time corrected for seasonal changes in the rotation of the earth (TU2). The maser frequency was also determined relative to the cesium frequency standards at Washington and London. The frequency of the molecular generator was calculated from the formulae

$$F_M = F_0 - (g^M - g)\frac{F_0}{86\,400}, \qquad (2)$$

$$g^M = \frac{1}{15}(U^M_{i+15} - U^M_i), \qquad (3)$$

and was checked with the formulae

$$F_M = F_0 + \Delta F, \qquad (4)$$

$$\Delta F = \frac{f - f^M}{f_0} F_0, \qquad (5)$$

$$f = f_0 - g\frac{f_0}{86\,400}, \qquad (6)$$

An Investigation of ...

where F_M is the frequency of the maser averaged over 15 days, F_o is the approximate value of the maser frequency used to calculate the frequency of the quartz generator f^M in Eq.(1), g^M is the diurnal rate of the quartz clock relative to the maser as calculated from Eq.(1) to (3) and averaged over 15 days, g is the diurnal rate of the quartz clock relative to TU2 and averaged over 15 days, f^M is the frequency of the quartz generator relative to the molecular generator whose average frequency over 15 days is taken to be F_o. Fig.2 shows a plot of F_M and $g^M - g$ as a function of time. Table 2 gives the values of the frequency of the above ma er and the accuracy with which it was determined. It is concluded that the possible change in the frequency of the molecular generator between 1958 and 1959 was 0.02 kc/s or one part and 10^9. The use of the molecular generator at the above Institute will ensure the determination of frequency to an accuracy of one part and 10^9 and the reproduction of the time scale can be achieved with the same accuracy. There are 3 figures, 3 tables and 2 references: 1 Soviet and 1 non-Soviet.

Card 4/6

S/589/62/000/058/001/002
A001/A101

AUTHOR: Konstantinov, A. I.

TITLE: The astronomical system of time reckoning

SOURCE: USSR. Komitet standartov, mer i izmeritel'nykh priborov. Trudy institutov Komiteta, no. 58 (118), 1962, Issledovaniya v oblasti izmereniy vremeni, 4 - 38

TEXT: The author describes the development of ideas of time, in particular Newtonian absolute uniform time, and emphasizes that there is no time flowing by itself: real is not time in general, but time inseparably related to motions and changes. The astronomical system of time reckoning is based on Earth's rotation assumed to be proceeding at a constant angular speed. Definitions of true solar and sidereal day, as units of astronomical time reckoning, are given, as well as expressions for corresponding hour angles which determine local true solar and local true sidereal time. Since both of them are not linear functions of t, Newtonian time, a necessity arises of introducing fictitious points whose motions relative to absolute time are uniform; therefore concepts are introduced

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The astronomical system of time reckoning

and explained of the mean point of vernal equinox, first mean Sun and second mean Sun. Expressions for mean hour angles and their relations to true hour angles are given, and the notion of equation of time, E, as a correction term in the conversion from one system to the other, is described. It is pointed out that the expression of E contains a quadratic term which leads to continuously increasing discrepancy between the values of mean time as determined from observations of the Sun and from sidereal time; by the present this discrepancy attained $0^{s}.005$ and by year 2,000 it will amount to $0^{s}.02$. The next problem dealt with is non-uniformity of the Earth's rotation, its discovery and a brief historical account of observations of the Moon, Sun and planets, supporting this concept. Lunar theories are mentioned including the latest theory of the Moon by Brown who introduced the Great Empirical Term describing periodical fluctuations in the Moon longitude. The fluctuations are ascribed entirely to non-uniformity of the Earth's rotation. Their values, starting from 1681, determined by various authors are presented in three tables. Next, the concept of ephemeris time is explained and defined in terms of universal time and an empirical correction term taking into account the non-uniformity of Earth's rotation. Recommendations of the International Conference in Paris 1950, approved by the 8th

Card 2/3

KONSTANTINOV, A.I.

Using the KhGIMIP molecular generator for determing actual frequencies of the quartz oscillator in the time and frequency service. Trudy inst.Kom.stand., mer i izm.prib. no.59:94-98 '62. (MIRA 16:1)

(Frequency measurement)

L 19339-63 EPA(b)/EWT(1)/FCC(w)/FS(v)-2/BDS/ES(v) AFFTC/ESD-3/
APGC Pd-4/Pe-4/Pg-4/Po-4/Pq-4 GW
ACCESSION NR: AR3002036 S/0269/63/000/005/0012/0012

SOURCE: RZh. Astronomiya. Otdel'nyy vypusk. Abs. 5.51.143

AUTHOR: Konstantinov, A. I.

TITLE: An astronomical system for computing time

CITED SOURCE: Trudy institutov Komitota standartov, mer i izmeritel'nykh priborov pri Sovet Ministrov SSSR, no. 58(118), 1962, 4-38

TOPIC TAGS: astronomical time, polar motion, ephemeris time

TRANSLATION: The author discusses the principles underlying an astronomical system for computing time, the motion of the poles, irregularity in the earth's rotation, and ephemeris time. He gives a brief survey of studies of the motion of the moon, sun and planets.

DATE ACQ: 30May63 SUB CODE: AI ENCL: 00

Card 1/1

ACCESSION NR: AT4026434 S/2589/62/000/059/0094/0098

AUTHOR: Konstantinov, A. I.

TITLE: Use of the molecular generator of the Khar'kovskiy gosudarstvenny*y institut mer i izmeritel'ny*kh priborov (Khar'kov State Institute of Measures and Measuring Instruments) (KhGIMIP) for determining the actual value of the frequency of a crystal generator in the time and frequency service

SOURCE: USSR. Komitet standartov, mer i izmeritel'ny*kh priborov. Trudy* institutov Komiteta, no. 59(119), 1962. Issledovaniya v oblasti izmereniya chastoty* (Investigations in the field of frequency measurement), 94-98

TOPIC TAGS: time, standard time, frequency measurement, molecular generator, crystal generator, quartz generator, astronomical time

ABSTRACT: At the present time, the requirement for constancy in the value of a reproduced standard frequency for the solution of many extremely important problems is given by a relative error between $1 \cdot 10^{-9}$ and $1 \cdot 10^{-10}$. However, the possible accuracy of astronomical time determinations, as used by the modern time service, is limited in principle to a relative error of $1 \cdot 10^{-8}$, since the very nature of astronomical time (TU_2) includes inequalities of this order of magnitude. Astronomical techniques therefore

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ACCESSION NR: AT4026434

cannot be used to maintain a standard frequency over the course of a year with an error of not more than $1 \cdot 10^{-9}$. This article describes the molecular generator constructed by A. Ya. Leykin of the Khar'kov State Institute of Measures and Measuring Instruments (KhGIMIP) and in permanent operation since March 1, 1958. The generator has been used as a time standard in the time broadcasting service since 1959. Every 24-hour period, the frequency of the KKh3 crystal clock generator is determined with respect to the molecular generator. The KKh3 clocks are the working clocks of the KhGIMIP time service. This made it possible to determine the behavior of the KKh3 clock both within the astronomical time (TU_2) system, as well as within the new type of signal transmission system of Washington and London. In this connection, it was assumed that the second signals of the KKh3 crystal clocks are in phase with the KKh3 resonator frequency, while the second radio signals of the WWV transmissions (Washington) and MSF transmissions (LOndon) are in phase with the carrier frequency of these radio stations, as controlled by the cesium frequency standards at Washington and London. The calculations used to determine the value of the frequency F_M of the molecular generator are explained in the article. On the average, the relative mean square error in the determination of the molecular generator frequency, connected with errors in the recording of radio signals in a 1-month interval, was $\pm 2 \cdot 10^{-9}$ for 1958 and $\pm 1 \cdot 10^{-9}$ for 1959. According to formulas

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given in the text with the mean-monthly values of the frequency of the crystal generator f_M and the behavior of the crystal clocks g, the author derived the values of the frequency of the KhGIMIP molecular generator for the middle of the month. These are tabulated in the article and represented graphically in Figure 1 of the Enclosure. On the basis of reduced deviations of the partial values of the molecular generator frequency from the mean for a two-year period, a computation was made of the mean-square errors of the partial values. These errors are given in Table 1 of the Enclosure separately for 1958 and for 1959-1960 in both an absolute measure (in kc) and a relative measure (in $1 \cdot 10^{-9}$). Since the method for the determination of the molecular generator frequency includes, as an intermediate link, the determination of frequency and of the behavior of the crystal clocks at the standard time and frequency services of both VNIIFTRI in Moscow and the Khar'kov State Institute of Measures and Measuring Instruments, the conclusion is valid that it is possible to determine the frequency value of crystal generators in Moscow and Khar'kov with an error of less than $1 \cdot 10^{-9}$. The article concludes with the following recommendations: 1) that each year, the frequency of the molecular generator be determined with respect to TU_2 time. The value of the frequency of the molecular generator with respect to ephemeral time is assumed to be known on the basis of previously made determinations; 2) that the value of the molecular generator frequency, determined according to TU_2 for the year elapsed (N-1), serve as a frequency reproduction standard in the current year (N); 3) that, as the determination of ephemeral time progresses, the constancy of the

ACCESSION NR: AT4026434

molecular generator frequency be checked against this time and that, simultaneously, a correction factor be worked up for the reproduced frequency in order to reduce it to a system of ephemeral time. Orig. art. has: 5 formulas, 2 tables and 1 figure.

ASSOCIATION: Komitet standartov, mer i izmeritel'ny*kh priborov (Committee for Standards, Measures and Measuring Instruments)

SUBMITTED: 00Feb60 DATE ACQ: 24Apr64 ENCL: 02

SUB CODE: AS NO REF SOV: 000 OTHER: 000

4/6

Card

VINNIKOV, Yevgeniy Mikhaylovich; KONSTANTINOV, A.I., nauchn. red.

[Measurement and reproduction of short time intervals]
Izmerenie i vosproizvedenie korotkikh intervalov vremeni.
Moskva, Standartgiz, 1963. 111 p. (MIRA 17:7)

L 15029-65 Pb-4 SSD/AMD/ASD(a)-5
ACCESSION NR: AP4044434 S/0247/64/014/004/0701/0706

AUTHOR: Konstantinov, A. I. B

TITLE: The role of conditioned signalization in the spatial analysis of bats.

SOURCE: Zhurnal vy*sshey nervnoy deyatel'nosti, v. 14, no. 4, 1964, 701-706

TOPIC TAGS: bat, spatial orientation, echo sounding, conditioned reflex, habit formation, habit extinction

ABSTRACT: An attempt was made to obtain an insight into the principles of spatial orientation in bats. The bat is considered as a highly specialized animal which has developed in its evolution a special method of acoustic orientation called echo sounding. The dynamics of the formation and extinction of direct flight to unknown feeding points was studied under conditions of unrestrained behavior in unfamiliar rooms. The experiments showed that directed behavior (or its extinction) in bats was in every case the result of

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ACCESSION NR: AP4044434

an elaborate conditioned response. After stabilization of the temporary connection to the location of the feeding spot, the motor habit rapidly becomes automatic. Following a change in the feeding point, a change in the motor stereotype was observed in all the animals, i.e., gradual extinction of the initial rectilinear trajectory of movement and elaboration of a new optimal path.' The process of the reshaping of spatial analysis with the elaboration of an optimally directed flight was accelerated as the experiments were repeated. Orig. art. has: 3 figures.

ASSOCIATION: Kafedra fiziologii vy*sshey nervnoy deyatel'nosti Leningradskogo gosudarstvennogo universiteta (Department of Physiology of Higher Nervous Activity, Leningrad State University)

SUBMITTED: 040ct63 ENCL: 00

SUB CODE: LS NO REF SOV: 009 OTHER: 008

Card 2/2

KONSTANTINOV, A.I.

Influence of the exclusion of visual reception on the controlled behavior of bats. Vest. LGU 19 no.15:72-75 '64.

(MIRA 17:11)

L 43217-65
ACCESSION NR: AP5010844 UR/0020/65/161/004/0989/0991

AUTHOR: Konstantinov, A. I.

TITLE: The effect of partial and full exclusion of the cerebral cortex on echolocation ability of bats

SOURCE: AN SSSR. Doklady, v. 161, no. 4, 1965, 989-991

TOPIC TAGS: echolocation, cerebral cortex, auditory analyzer, depressive agent, trephination, bat

ABSTRACT: The functional value of the cerebral cortex of bats during echolocation of small obstacles has been studied. Because of morphological features of the auditory analyzer, it is suggested that analysis of high-frequency signals is less connected with the function of the cortex but depends more on the size and complexity of the subcortical auditory centers. Experiments were conducted with common bats Plecotus auritus and brown bats Myotis mystacinus in a chamber with two parallel rows of vertical wires. During free-flight periods, the number of times the bats flew through the barrier without touching the wires was recorded. Trephination was then performed above the

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L 43217-65
ACCESSION NR: AP5010844 0

temple regions of the cortex, and a control experiment was conducted using the same flight periods. Functional exclusion of the cortex was accomplished by application of potassium chloride (KCl), a general cortical depressant, to the exposed skull areas of six animals. A local depressant, γ-aminobutyric acid (GAMK), was applied to the temple areas of six other bats. It was found that GAMK did not noticeably affect the behavior of the bats nor impair their acoustical orientation in the detection and avoidance of obstacles. Application of KCl, however, caused complete cessation of motor activity in the first few minutes. Normally, the test animals passed through the wires with a frequency of 75.6 ± 2.6%; after trephination the frequency reached 83 ± 1.3%. Statistically reliable differences in this frequency were observed only in the first five minutes after the application of KCl (63.4 ± 5%). These differences were explained in terms of the animals' inability to coordinate wind movements during flights between two wires, and not by any reduction in echolocation capability. It was concluded that temporary exclusion of the cortical section of the auditory analyzer causes no essential changes in the echolocation ability of bats for small obstacles. During brief total depression of the cortex, spatial motor orientation is disturbed. [JS]

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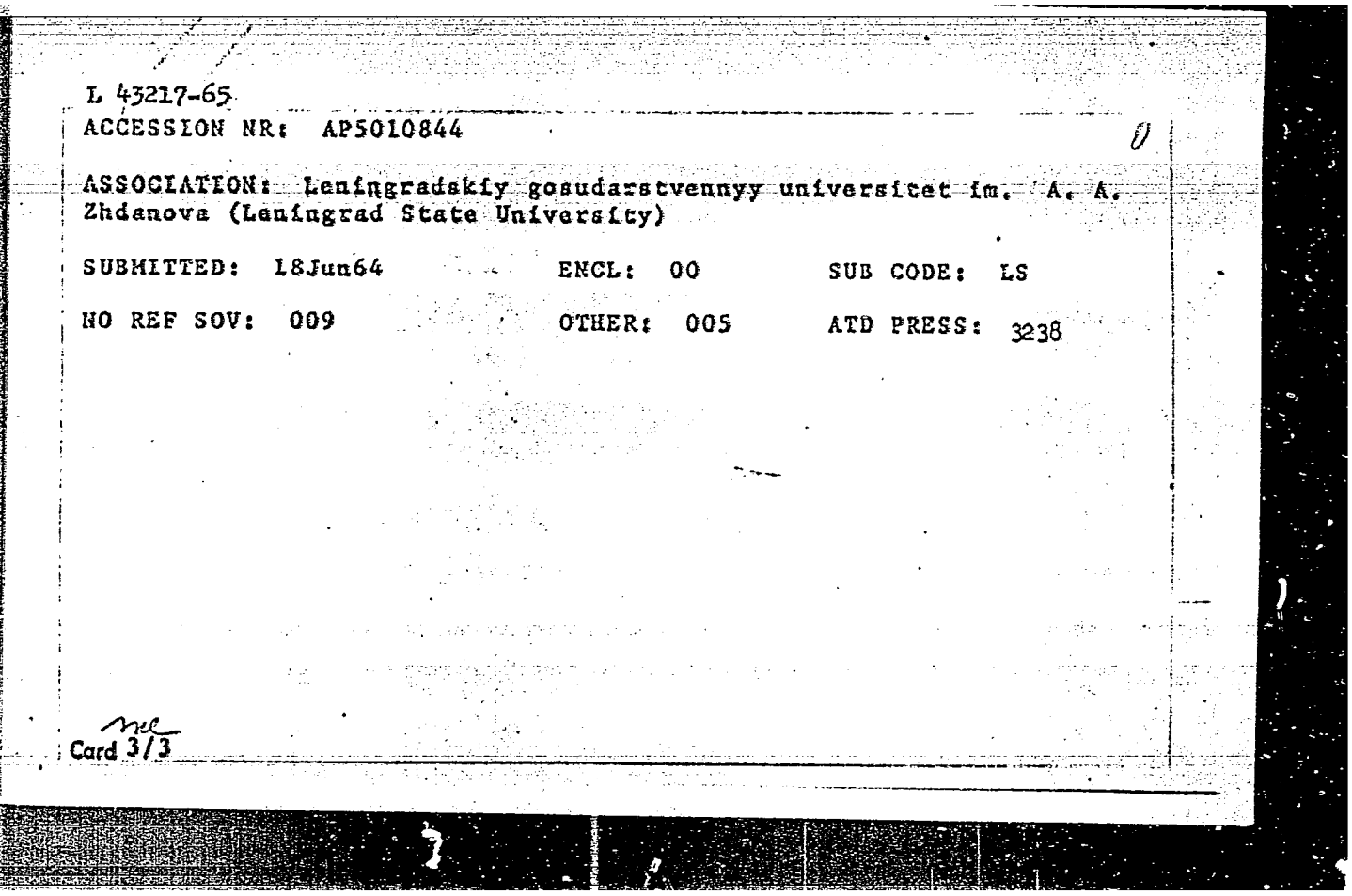


L 43217-65
ACCESSION NR: AP5010844 0

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University)

SUBMITTED: 18Jun64 ENCL: 00 SUB CODE: LS

NO REF SOV: 009 OTHER: 005 ATD PRESS: 3238

Card 3/3

KONSTANTINOV, A. K.

"The Problem of the Effect of the Protein Level in Fodder Rations on the Increase in Weight of Calves During the Weaning Stage." Cand Agr Sci, Leningrad Veterinary Inst, Leningrad, 1953. (RZhBiol, No 6, Mar 55)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (15)

KONSTANTINOV, A.K.

Phosphorites of the Mezhozernoye section in the Selety-Stepnyak region. Min. syr'ia no.10:33-40 '64. (MIRA 18:3)

KONSTANTINOV, A Kh

25100
S/198/61/007/003/001/013
D264/D303

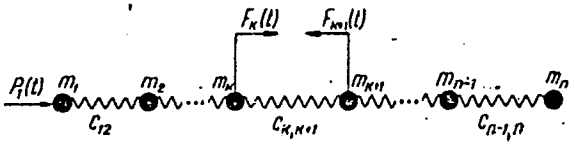
10 6300

AUTHORS: Kil'chevs'kyy, M.O., Konstantynov, A.Kh., and Protsenko, O.P. (Kyyiv)

TITLE: On the theory of longitudinal vibrations of a system of material points connected by springs

PERIODICAL: Prykladna mekhanika, v. 7, no. 3, 1961, 233 - 238

TEXT: The article considers a material system under the action of non-periodic forces, consisting of masses m_i (i = 1, 2, ... n) joined by springs whose constants are $c_{i,i+1}$ (i = 1, 2, ... n-1).



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From an investigation of the longitudinal vibrations of such a system in order to find the frequency a high-order determinant is obtained. The article proposes a method of solving the resulting equations. The authors consider the action of a non-periodic force $P_1(t)$ applied to the mass m_1. The system is considered in two parts: The system of masses whose indices are $\leq k$, $k+1$, and those whose indices are $\geq k+1$, $k+2$. The action of the spring between m_k and m_{k+1} is replaced by elastic forces which must be determined. The generalized co-ordinates are the displacements of the masses of the system. Considering the motion for each system separately, the equations of motion for the system m_j ($j = 1, 2, \ldots k$) are given and solved. From the known coordinates of the center of inertia of the system, and by substitution the equation of motion may be written

$$mx_c = \sum_{i=1}^{k} m_i x_i = \sum_{s=1}^{k-1} C_s \cos \omega_s t \sum_{i=1}^{k} m_i \Delta_i(\omega_s^2) + \ldots \quad (11)$$

On the theory of ...

$$+\sum_{s=1}^{k-1} D_s \sin \omega_s t \sum_{i=1}^{k} m_i \Delta_i(\omega_s^2) + (A + Bt)\, m, \qquad (11)$$

where $m = \sum_{i=1}^{k} m_i$. It is supposed that at a given instant of time the first and last mass of the system experience unit impulses. Then the initial expressions are

$$x_{j0}^{(2)} = 0 \quad (j = 1, 2, \ldots, k); \quad \dot{x}_{j0}^{(2)} = 0 \quad (j = 2, 3, \ldots, k-1); \qquad (12)$$

$$\dot{x}_{10}^{(2)} = \frac{1}{m_1}; \quad \dot{x}_{k0}^{(2)} = \frac{1}{m_k}. \qquad (12)$$

When the system experiences forces $P_1(t)$ and $F_k(t)$, the displacement of the points of the system amy be written

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$$x_j^{(2)} = \sum_{l=1}^{k-1} \frac{\Delta_j(\omega_l^2)}{\omega_l \sum_{a=1}^{k} m_a \Delta_a^2(\omega_l^2)} \left[\Delta_1(\omega_l^2) \int_0^t P_1(t_1) \sin \omega_l (t - t_1)\, dt_1 + \right.$$

$$\left. + \Delta_k(\omega_l^2) \int_0^t F_k(t_1) \sin \omega_l (t - t_1)\, dt_1 \right] + \frac{1}{m_1} \int_0^t P_1(t_1)(t - t_1)\, dt_1 + \qquad (13.)$$

$$+ \frac{1}{m_k} \int_0^t F_k(t_1)(t - t_1)\, dt_1. \qquad (13)$$

The general solution is of the form $x_j = x_j^{(1)} + x_j^{(2)}$ (j = 1, 2, ... k). The equation of frequency of the original system has one zero solution. Using the proposed method, as many zero solutions

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are obtained as the number of parts, into which the system is divided, [Abstractor's note: In the above case two]. There is no inconsistency here, since there is still one non-zero solution which has not been evaluated and which enters the analytical expression of the elastic force $F_k(t)$. Insofar as $F_k(t)$ is a continuous function possessing all derivatives, it may be written as a Taylor series for each interval. By this method the unknown function is obtained in the following form:

$$F_k\left(\frac{p-j}{p}t\right) = \Phi_{k,k+1}\left(\frac{p-j}{p}t\right) + c_{k,k+1}\sum_{i=0}^{p-j-1}\left\{\sum_{\sigma=k+1}^{n-1}\frac{\Delta_{k+1}^2(\omega_\sigma^2)}{\omega_\sigma^2\sum_{\alpha=k+1}^{n} m_\alpha\Delta_\alpha^2(\omega_\sigma^2)}\left[F_k\left(\frac{i}{p}t\right)\left(\cos\frac{p-j-i}{p}\omega_\sigma t - \cos\frac{p-j-i-1}{p}\omega_\sigma t\right) + F_k'\left(\frac{i}{p}t\right)\left(\frac{1}{\omega_\sigma}\sin\frac{p-j-i}{p}\omega_\sigma t - \right.\right.\right. \quad (21)$$

Card 5/8

On the theory of ...

$$-\frac{1}{\omega_\sigma}\sin\frac{p-j-i-1}{p}\omega_s t+\frac{p-j-i-1}{p}t\cos\frac{p-j-i-1}{p}\omega_s t-$$

$$-\frac{p-j-i}{p}t\cos\frac{p-j-i}{p}\omega_s t\Big)\Big]+\ldots$$

$$+\sum_{\sigma=1}^{k-1}\frac{\Delta_k^2(\omega_\sigma^2)}{\omega_s^2\sum_{\alpha=1}^{k}m_\alpha\Delta_\alpha^2(\omega_s^2)}\Big[F_k\Big(\frac{i}{p}t\Big)\Big(\cos\frac{p-j-i}{p}\omega_\sigma t- \qquad (21)$$

$$-\cos\frac{p-j-i-1}{p}\omega_\sigma t\Big)+F_k'\Big(\frac{i}{p}t\Big)\Big(\frac{1}{\omega_\sigma}\sin\frac{p-j-i}{p}\omega_\sigma t-$$

$$-\frac{1}{\omega_\sigma}\sin\frac{p-j-i-1}{p}\omega_\sigma t+\frac{p-j-i-1}{p}t\cos\frac{p-j-i-1}{p}\omega_\sigma t-$$

$$-\frac{p-j-i}{p}t\cos\frac{p-j-i}{p}\omega_\sigma t\Big)\Big]+\Big(\frac{1}{m_{k+1}}+$$

Card 6/8

On the theory of ...

$$+\frac{1}{m_k}\left[\frac{(2i-2p+1)t^2}{2p^2}F_k\left(\frac{i}{p}t\right)+\right.$$

$$\left.+\frac{3p(2i+1)-2(3i^2+3i+1)}{6p^3}t^2F_k'\left(\frac{i}{p}t\right)\right]\Bigg\}; \qquad (21)$$

where $F_k(0) = \Phi_{k,k+1}(0)$. The author states that this method is sufficiently effective for investigating transient processes which last for a short time interval. In this case the appearance of secular terms in the solution does not cause any difficulty. These terms may be avoided if the formulae of mechanical quadratures are used to solve the integral equation. If the system consists of a large quantity of masses, it can be broken down into several systems so that the problem becomes one of solving a system of integral equations. There are 1 figure and 2 Soviet-bloc references.

Card 7/8

25106
S/198/61/007/003/001/013
D264/D303

On the theory of ...

ASSOCIATION: Instytut mekhaniky AN URSR (Institute of Mechanics, AS UkrSSR)

SUBMITTED: June 15, 1960

Card 8/8

33712
S/198/62/008/001/005/005
D299/D302

10.7500 1327

AUTHOR: Konstantinov, A. Kh. (Kyyiv)

TITLE: Approximate estimate of the influence of radial displacements on the frequency of free oscillations of a cylindrical shell

PERIODICAL: Prykladna mekhanika, v. 8, no. 1, 1962, 95-98

TEXT: It is shown that neglect of radial displacements in the investigation of longitudinal oscillations of cylindrical shells may lead to considerable error in calculating the frequencies. Rayleigh's method is used for an approximate estimate of the influence of radial displacements on the first frequency of the free oscillations. Only axisymmetrical oscillations are considered. The longitudinal displacements are denoted by $u(x,t)$ and the radial ones by $w(x,t)$. The lowest frequency satisfies the relation

$$\omega^2 = \frac{P_{max}}{T_{max}} \qquad (3)$$

Card 1/5

Approximate estimate of ...

where P is the potential energy and T the kinetic energy. The displacements u and w are approximately expressed by the formulas

$$u(x,t) = u_0(x)\cos\omega t; \qquad w(x,t) = w_0(x)\cos\omega t \tag{4}$$

where the functions u_0 and w_0 are determined from a statical calculation of a shell which is subjected to the constant longitudinal compressive stresses F. After computations, one obtains the expressions

$$P_{max} = A(1 + 0.1\nu^2) \tag{14}$$

$$T_{max} = B\left(1 + \frac{3\nu^2}{\mu^2}\right) \tag{15}$$

Card 2/5

Approximate estimate of ...

where $A = \pi RF^2 l/Eh$ and $B = mF^2 l^2/6E^2 h^2$ (R being the radius of the middle surface, h the thickness and l the length of the shell). With $\nu = 0.3$, one obtains from (3), (14) and (15) the formula

$$\omega^2 = \frac{1{,}01A}{B\left(1 + \frac{0{,}27}{\mu^2}\right)} \qquad (16)$$

If the radial displacement is not taken into account, one obtains

$$\overline{\omega}^2 = \frac{0{,}91A}{0{,}82B} \qquad (17)$$

Card 3/5

Approximate estimate of ...

Transforming formulas (16) and (17) to dimensionless quantities, one obtains

$$\omega^* = \frac{1,74}{\sqrt{\mu^2 + 0,27}} \qquad (18)$$

$$\bar{\omega}^* = \frac{1,82}{\mu} \qquad (19)$$

where

$$\omega^* = \omega \frac{R}{a}\ ; \qquad \bar{\omega}^* = \bar{\omega}\frac{R}{a}\ ; \qquad a = \sqrt{\frac{E}{\rho}}$$

Card 4/5

Approximate estimate of ...

(ρ being the density). The graphs of the functions $\omega^*(\mu)$ and $\bar{\omega}^*(\mu)$ are plotted on a figure, ($\mu = 1/R$). With small values of μ (i.e. short shells), the graphs differ considerably; thus, for $\mu = 1$, formula (19) yields an 18% higher value for the frequency than formula (18) which makes allowance for the radial displacements. In the case of long shells ($\mu > 2$), the radial displacements account for a 5% decrease in the value of the frequency. There are 2 figures and 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc (a translation of Rayleigh's "Theory of Sound").

ASSOCIATION: Instytut mekhaniky AN USSR (Institute of Mechanics AS UkrRSR)

SUBMITTED: June 22, 1961

Card 5/5

KIL'CHEVSKY,N.A.;KONSTANTINOV,A.KH.;REMIZOVA,N.I. (Kiev)

"Solutions of dynamic boundary value problems of the theory of shells ensuing from the integrodifferential equations of motion"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 Jan - 5 Feb 64.

KIL'CHEVSKIY, N.A. [Kil'chevs'kyi, M.O.]; KONSTANTINOV, A.Kh. [Konstantynov, A.Kh.]

Forced vibrations of a thick conic panel in the nonclassical formulation . Dop. AN URSR no.2:194-197 '64. (MIRA 17:5)

1. Institut mekhaniki AN UkrSSR. 2. Chlen-korrespondent AN UkrSSR (for Kil'chevskiy).

KONSTANTINOV, A.Kr. (Kiyev)

Approximate derivation of Green's tensor for a thick tapered panel. Prikl. mekh. 1 no.9:52-57 '65. (MIRA 18:10)

1. Institut mekhaniki AN UkrSSR.

inversion of the systems of equations of classical shell theory. Attention is concentrated mainly on solutions of concrete boundary value problems. An example is given of the dynamics of a thick plate, rectangular in plan, supported at the corners on smooth

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ACC NR: AR6019264

absolutely rigid supports, under the effect of a concentrated force variable in time applied at an arbitrary point and directed along the normal to the mean surface of the plate. Also considered is the analogous problem for a thick conic panel. Numerical methods are discussed for the solution of systems of integro-differential equations, in particular, methods based on the introduction of focused nuclei and on the method of collocation, allowing the application of high-speed calculating machines. 34 references.

SUB CODE: 12

Card 2/2

AUTHOR: Ambartsumyan, A. A. (Kiev); Konstantinov, A. Kh. (Kiev)

ORG: Institute of Mechanics, AN UkrSSR (Institut mekhaniki AN UkrSSR)

TITLE: Lateral elastic impact of an anisotropic plate by a sphere

SOURCE: Prikladnaya mekhanika, v. 2, no. 11, 1966, 1-4

TOPIC TAGS: solid body impact, plate impact, impact duration, impact load

ABSTRACT: The deflection of an anisotropic thin plate of rectangular planform, simply supported along all edges, caused by the impact of an isotropic elastic sphere is determined, as well as the forces due to interaction between plate and sphere, and the duration of the impact. The partial differential equation taken from S. A. Ambartsumyan's "Theory of Anisotropic Plates" which describes the transverse vibrations of an impacted plate is used as initial one, taking an unknown concentrated load as a result of the sphere-plate interaction. The equation is solved by an operational method using the Laplace-Carson transform and the form of the solution proposed by Navier. A general expression for the deflection of the plate as a function of impact-point coordinates and time is derived, and a formula for the deflection at the center of the plate caused by a central impact is deduced. The procedure of approximate determination of the interaction force is indicated, and a formula (containing the velocity, mass, elasticity and time parameters) for calculating its

Card 1/2

KONSTANTINOV, A.N.

Classification of technical documents. Vest. mash. 38 no.9: 69-70 S '58. (MIRA 11:10)
(Classification--Engineering)

KONSTANTINOV, Aleksandr Nikolayevich; SAMSONOV, Nikolay Aleksandrovich; VEYTSMAN, Moisey Abramovich; IVANETS, Konstantin Yakovlevich; YEFREMOVA, T.D., vedushchiy red.; FEDOTOVA, I.G., tekhn.red.

[Machinery and equipment of petroleum refineries; design and construction. Reference book] Apparaty i oborudovanie neftepererabatyvaiushchikh zavodov; raschet i konstruirovanie. Spravochnaia kniga. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1960. 573 p. (MIRA 13:5)
(Petroleum refineries--Equipment and supplies)

KONSTANTINOV, Aleksandr Mitrofanovich; TSARENKO, A.P., redaktor; KHITROV, P.A., tekhnicheskiy redaktor.

[Manual on safety measures for conductors of passenger cars] Pamiatka po tekhnike bezopasnosti provodniku passazhirskikh vagonov. Izd.2-oe. Moskva, Ges.transp.zhel-dor.izd-vo, 1956. 50 p. (Railroads--Safety measures) (MLRA 9:6)

KONSTANTINOV, A.N., SUKHOTSKIY, M.L., SUKACHEV, V.V., KAMYSHANOV, G.I., TSARENKO, A.P., red.; KHITROV, P.A., tekhn.red.

[Advanced work methods for passenger service personnel] Peredovye metody truda passashirskikh rabotnikov. Moskva, Gos.transp. zhel-dor. izd-vo, 1958. 91 p. (MIRA 11:7)
(Railroads--Employees)
(Railroads--Passenger traffic)

YEVDOKIMOV, I.I.; ALEKSEYEV, V.D.; ASHIKHMIN, A.K.; BAYEV, N.V.; BEGLAR'YAN, P.A.; BYCHKOV, I.A.; VESLOVA, Ye.T.; VYZHEKHOVSKAYA, M.F.; GURETSKIY, S.A.; DEMIDOV, I.M.; YASIPOV, Ye.P.; ZHUKOV, V.D.; ZELINSKIY, M.G.; ZOL'NIKOV, F.T.; ZOLOTOVA, L.I.; KIVIN, A.N.; KOMARNITSKIY, Yu.A.; KONSTANTINOV, A.N.; KUL'CHITSKAYA, A.K.; MAKSIMENKO, I.I.; MELENT'YEV, A.A.; MOROZOV, I.G.; MURZINOV, M.I.; OZEMBLOVSKIY, Ch.S.; OSTRYAKOV, K.I.; PANINA, A.A.; PAVLOVSKIY, V.V.; PERMINOV, A.S.; PERSHIN, B.F.; PRONIN, S.F.; PSHENNYY, A.I.; POKROVSKIY, M.I.; RASPONOMAREV, Ye.A.; SEMIN, I.N.; SKLYAROV, Yu.N.; TIBABSHEV, A.I.; FARBEROV, Ya.D.; FEDOROV, G.P.; SHUL'GIN, Ya.S.; YAKIMOV, I.A.; VERINA, G.P., tekhn.red.

[Labor feats of railway workers; stories about the innovators] Trudovye podvigi zheleznodorozhnikov; rasskazy o novatorakh. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 267 p. (MIRA 12:9)
(Railroads) (Socialist competition)

KONSTANTINOV, A.N.

New posters for railroad employees. Put' i put.khoz. 4 no.9:46 S '60.
(MIRA 13:9)

1. Nachal'nik plakatnoy redaktsii Transzheldorizdata.
(Railroads--Employees)

GERBACH, Vasiliy Vasil'yevich; KUZNETSOV, Konstantin Alekseyevich; LIVSHITS, Lev Zakharovich; PLYASUNOV, Vladimir Ivanovich; KONSTANTINOV, A.P., kand.ist.nauk, obshchiy red.; KAZAROV, Yu.S., red.; FRUMKIN, P.S., tekhn.red.

[Workers of the Baltic Factory in three revolutions] Rabochie-Baltiitsy v trekh revoliutsiiakh. Pod obshchei red. A.P.Konstantinova. Leningrad, Gos.soiuznoe izd-vo sudostroit.promyshl., 1959. 146 p. (MIRA 12:5)
(Leningrad--Shipbuilding workers)

Konstattinov, A. P. (USSR). (Electrical Seismograph). Russian Patent 105846, issued July 31, 1933.
Relates to electrical seismograph consisting of a generator and a resonance body. Capacity of latter is so arranged that it can be changed by effects of shocks. Claim allowed - 1.

KONSTANTINOV, A. R.

"Measurement of Light Wind Velocities Under Normal Conditions," No 2, pp 21-30. (Meteorologiya i Gidrologiya, No 6 Nov/Dec 1947)

SO: U-3218, 3 Apr 1953

FA 172T33

USSR/Geophysics - Forest-Protective Belts Microclimate 21 Oct 50

"Influence of Forest Belts on Wind Structure and Speed," A. R. Konstantinov, State Hydrol Inst

"Dok Ak Nauk SSSR" Vol LXXIV, No 6, pp 1065-1069

Action of forest-protective belts upon wind has shown protective effectiveness of belts of different width, but equal deg of spacings [i.e., not solid belt, but belt having openings at intervals] is practically equal. Thus, width of belts from standpoint of wind-protection can be reduced to min; available data indicates this min is 10 m for most steppe and

172T33

USSR/Geophysics - Forest-Protective Belts (Contd) 21 Oct 50

forest-steppe regions. Independent of width, wind-protective belts are effective for deg of openness of about 30%. Submitted 10 Aug 50 by Acad A. A. Grigor'yev.

172T33

KONSTANTINOV, A. R.

USSR/Meteorology - Precipitation Aug 52

"Problem of Influencing Atmospheric Precipitations by a System of Measures of Controlling Nature," A. R. Konstantinov, Cand Phys-Math Sci, Leningrad State Hydrol Inst

"Meteorol i Gidrol" No 8, pp 7-12

Effect of wooded belts on humidity and pptns, previously discussed by G. P. Kalinin (cf. "Meteorol i Gidrol" No 1, 1950) and others, is confirmed by the author. During the summer, i.e., the most important agricultural season,

229T102

an addnl 70% of pptns may be gained, thus producing high and stabilized crops, he states.

229T102

KONSTANTINOV, A. R.

PA 245T85

USSR/Meteorology - Turbulent Mixing **Nov 52**

"Structural Methods for Calculating Coefficient of Turbulent Mixing," A. R. Konstantinov and A. F. Marenkova, Candidates of Physicomath Sci, Leningrad State Inst of Hydrology

"Meteorol i Gidrol" No 11, pp 30-33

Discuss the turbulent structure of wind and the accuracy of various methods in calculating the coefficient of turbulent exchange.

245T85

1. KONSTANTINOV, A. R.

2. USSR (600)

4. Meteorology, Agricultural

7. Change of climate in relation to the plan for the transformation of nature in the arid regions of the U.S.S.R. Kh. P. Pogosyan. Reviewed by A. R. Konstantinov, ed. Izv. Vses. geog. obshch. 84, No. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

KONSTANTINOV, A.R., kandidat fiziko-matematicheskikh nauk

Adjustment for vertical gradient of the temperature in computing the turbulent heat exchange of the underlying surface of the atmosphere. Meteor.i gidrol. no.1:32-35 Ja '53. (MLRA 8:9)

1. Gosudarstvennyy gidrologicheskiy institut, Leningrad
(Atmospheric temperature)

KONSTANTINOV, A. R.; STRUZER, L. R.

Windbreaks, Shelterbelts, Etc.

Effect of the size and shape of fields bounded by shelterbelts on yield of agricultural crops, Les. i step' 5, No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

KONSTANTINOV, A. R., and STRUZER, L. R.

"An Erroneous Scheme of Turbulent Mixing," Meteorol. i Gidrologiya, No 7, 1953, pp 48-51

Criticism of M. I. Budyko's proposed scheme for computing the coefficient of turbulent exchange in the atmosphere. It is shown that the considered scheme contracts elementary physical concepts. The presented comparison of the values of the coefficient of turbulent exchange computed according to the Budyko scheme and according to experimental data for cases of evaporation from reservoirs, steamy fields, and marshes shows considerable divergence between computation and experiment. The authors arrive at the conclusion that the scheme of computation of the coefficient of turbulent exchange as worked out by Budyko is not only insufficiently grounded theoretically but also in poor agreement with data of experimental observations. (RZhGeol, No 6, 1955) SO: Sum.No. 713, 9 Nov 55

KONSTANTINOV, A.R.

Vertical profile of meteorological elements in the earth's surface atmospheric layer. Meteor. i gidrol. no.9 :32-34 S-O '53.
(Atmosphere) (MLRA 8:9)

KONSTANTINOV, A.R.; STRUZER, L.R.

Measurement of the total evaporation and transpiration of agricultural crops by means of evaporimeters. Trudy GGI no.45:66-94 '54. (MLRA 8:11)

(Plants--Transpiration) (Evaporation)

KONSTANTINOV, A.R.

Comparison of different methods for determining evaporation. Trudy GGI no.45:95-120 '54. (MLRA 8:11)
(Evaporation)

14-57-6-12065

Translation from: Referativnyy zhurnal, Geografiya, 1957, Nr 6, p 57 (USSR)

AUTHORS: Fedorova, T. G., Konstantinov, A. R.

TITLE: An Experiment on the Use of a Floating Evaporator (Opyt ekspluatatsii plavuchey isparitel'noy ustanovki)

PERIODICAL: Tr. Gos. gidrol. in-ta, 1954, Nr 45, pp 182-195

ABSTRACT: This paper describes the experiments on a floating evaporator (FE) built by S. S. Ginko, and the results of observations made on it in 1952 and 1953. FE was placed in use in May, 1952, on Lake Valday, which is 21 km^2 in area, and 25 m deep in the place where FE was installed. FE was mounted on a raft which turned in such a way that the apparatus held a constant position in respect to the wind. The raft was provided with spray guards which were effective in waves up to 1 m. high; even with a greater wave height, only the

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14-57-6-12065

An Experiment on the Use of a Floating Evaporator (Cont.)

evaporators near the edge could be sprinkled by the spray. No water was seen to splash out of them. FE contained apparatus for measuring evaporation (E), wind speed variations, air temperature, water temperature at the lake surface and at various depths, and atmospheric humidity. All the evaporators were in the form of cylindrical containers with flat bottoms. Precipitation was measured by rain gauges (0.05 m^2); variations of other meteorological elements at heights of 0.2, 1 and 2 m. were determined by means of a gradient pole; air temperatures and moisture were measured by large suction psychrometers; wind velocities, by manual anemometers; water temperature to depth of 0.01 m, by floating thermometers, and at depths of 1, 3, 5, 10, 15, 20, and 25 m, by depth thermometers. Evaporation was observed at 7 am and 7 pm. All other elements were studied four times a day: at 1 a.m, 7 a.m., 1 p.m. and 7 p.m. Results of the observations established that absolute humidity above the lake's surface was four percent higher, and that average wind velocity at the elevation of 2 m was twice as high as the values obtained at

Card 2/3

KONSTANTINOV, A.R.; PUSHKAREV, V.F.

Characteristics of conditions of evaporation and transpiration from agricultural fields in a zone of excess humidification. (MLRA 8:11)
Trudy GGI no.46:146-192 '54.
(Evaporation) (Plants--Transpiration)

KONSTANTINOV, A.R.; PUSHKAREV, V.F.; SAMOKHINA, K.P.

Characteristics of evaporation regime in agricultural fields in reclaimed virgin and waste lands. Trudy GGI no.48:5-21 '55. (MLRA 9:7)
(Evaporation)

KONSTANTINOV, A.R.

Principles of methods of computing evaporation in natural conditions. Trudy GGI no.48:22-37 '55. (MLRA 9:7)
(Evaporation)

KONSTANTINOV, A. R.

14-1-513

Translation from: Referativnny Zhurnal, Geografiya, 1957, Nr 1, pp. 56-57 (USSR)

AUTHOR: Konstantinov, A. R.

TITLE: Basis for a Method of Calculating Evaporation According to the Data Available to Meteorological Stations (Obosnovaniye metodiki rascheta ispareniya po dannym meteorologicheskikh stantsiy)

PERIODICAL: Tr. Gos. gidrol. in-ta, 1956, Nr 54 (108), pp. 5-74

ABSTRACT: Since the existing metereological station network does not make gradient observations, the problem arises of adapting a plan of calculation of meteo-elements at two heights to the observations conducted by this network. This adaptation would take into account auxiliary data such as the roughness of the underlying surface and the objective, empirical connection between the metereological data submitted by the network stations. The calculation of turbulent currents according to gradient

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Basis for a Method of Calculating Evaporation According to the Data Ava

measurements (Tr. Gos. gidrolog. in-ta, 1955, Nr 45) is the basis of the method worked out by the author. Correlations were established in measuring the temperature of similar surfaces which made it possible to determine the value of temperature and humidity at the level of the layer of roughness (the height at which the wind velocity is reduced to 0 is taken as the lower level of the measurements): $T_o - T_{200} = m_T (T_n - T_{200})$; $e_o - e_{200} = m_e (e_n - e_{200})$, where T_o, e_o and T_{200}, e_{200} stand respectively for the temperature and absolute humidity at the level of the layer of roughness and at the 2 meter level and m_T and m_e are the empirical coefficients, determined by given gradient measurements, depending on the parameter of roughness (z_o) and the type of stratification. Introducing the z_o value (R_i) (R_i = Richardson's number) makes it possible to exclude the dependence on stratification of m_T and m_e. The values z_o, m_T and m_e were determined on the basis of gradient measurements, for water, snow and soil surfaces. The wind, temperature and humidity contours above these surfaces were drawn according to their values. The rise

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14-1-513

compiled to determine the actual difference between the temperature of the soil (T_n) and the temperature at a height of 2 meters. A gradient for absolute humidity has also been established. These measures will eliminate the difficulties noted. Observations made at 1, 7, 13 and 19 hours should be used in order to calculate evaporation according to the proposed method. They determine the average intensity of evaporation for each period and then for the 24-hour period. The amount of evaporation for a period under calculation is obtained by multiplying these quantities by the time. This method of calculation was checked by observations made by the Valday Scientific Research Hydrological Laboratory. The check indicated a satisfactory agreement of calculated and measured quantities. The author believes that the method described above could be adapted to widespread practical use. Bibliography: 43 references.

A. B.

ASSOCIATION: State Hydrological Institute (Gos. gidrol. in-t.)

KONSTANTINOV, A.R.; KHARCHENKO, K.I.

Determination of evaporativity in the Sal Steppe region. Trudy GGI no.57:73-85 '56. (MLRA 10:6)

(Sal Steppe--Evaporation)

KONSTANTINOV, A.R.

Theory of cup anemometers and its application to wind speed measurements and to the choice of best design for the instrument. [Trudy] LO NTO Priborprom. Sekt. gidromet. i geofiz. prib. no.1:5-67 '57. (MIRA 11:6)

(Anemometer)

KONSTANTINOV, A.P.; MOLCHANOV, A.L.

Estimating changes produced by afforestation in the evaporation and water balance of soils in steppe and forest-steppe zones of the European part of the U.S.S.R. Trudy KazNIGMI no.8:64-93 '57. (MIRA 11:12)

(Forest influences) (Soil moisture)

KONSTANTINOV, A. R. and KUPRIYANOV, V. V. (Editors)

Experimental investigation of the Elements of the Water Balance in Valday. Trudy Gosudarstvennogo gidrologicheskogo instituta (Transactions of the State Hydrological Inst.) No. 59, 1957, 224pp., 6 articles.

AUTHOR: Konstantinov, A. R. SOV/ 5o-58-7-15/2o

TITLE: Directions for the Carrying out of Observations of the Evaporation of the Fields (Rukovodstvo po proizvodstvu nablyudeniy nad ispareniyem s sel'skokhozyaystvennykh poley) II. Observations of the Evaporation by Means of the Gradient Method (Chast' II. Nablyudeniya nad ispareniyem gradiyentnym metodom) Gidrometeoizdat. L. 1957

PERIODICAL: Meteorologiya i gidrologiya, 1958, Nr 7, pp. 56-59 (USSR)

ABSTRACT: The 2nd part of the "Directions for the Carrying out of Observations of the Evaporation of Fields" published in 1957 deals with the observations of the evaporation by means of the gradient method. This is a further development of this method which had been originally explained in the "Meteorological Directions for Hydrometeorological Stations", 1954, Nr 5. The calculation scheme by D. L. Laykhtman (Refs 4 and 5) was taken as basis for these directions, as it is far better founded than that elaborated by the Geophysical Main Observatory. This scheme lately has been simplified to a great extent and thus is suited for general use. It is, however, far from being perfect. The main error of the

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Directions for the Carrying out of Observations of the Evaporation of the Fields. II. Observations of the Evaporation by Means of the Gradient Method. Gidrometeoizdat. L. 1957

calculation method by Laykhtman as well as of other schemes of the GGO is to be found in the use of the hardly exact classical calculation schemes of the influence of the temperature stratification of the atmosphere on the amount of evaporation. It must be pointed out that the table of the stability of the parameter ε in the "Directions" contains wrong data. This contradicts the calculation scheme by Laykhtman as well as the experimental data by D. L. Laykhtman (Ref 5) T. A. Ogneva (Ref 7) and S. A. Sapozhnikova (Ref 8). The nomogram proposed by the "Directions" for the calculation of the evaporation cannot be regarded as good as it is impossible to calculate by its use the condensation quantities. They play, however, a decisive role in the humidity exchange between the surface of the earth and the atmosphere, especially in arid areas. The only calculation formula is written down in a wrong way and is only insufficiently corrected in the enclosed list of misprints. The interrelation between the displacement stratum and the height of the growth of grass suggested in the "Directions", which is equal to 2/3, is not

80395

3.5000 SOV/169-59-4-3735

Translation from: Referativnyy zhurnal, Geofizika, 1959, Nr 4, p 80 (USSR)

AUTHOR: Konstantinov, A.R.

TITLE: Three-Bladed Anemograph - a Device for Recording the Horizontal and the Vertical Components of the Wind Velocity in the Layer of the Atmosphere Near the Earth's Surface

PERIODICAL: Tr. Gos. gidrolog. in-ta, 1958, Nr 70, pp 84 - 96

ABSTRACT: A three-bladed anemograph developed by the author for recording simultaneously the instantaneous values of the horizontal and the vertical components of the wind velocity is described. A description of the method of operating the device under field conditions and the method of processing the results are given. The device consists of a barrel fastened rigidly to the vertical pedestal of a usual weather vane, which is directing the horizontal axis of the barrel into a place perpendicular to the inflowing stream. Along the axis of the barrel, two shafts, insulated from each other, are led out; to one of the shafts a plate is fastened in a horizontal plane, to the other - a plate

Card 1/2

KONSTANTINOV, A.P.

3(4,7) PHASE I BOOK EXPLOITATION [illegible]

Vsesoyuznyy gidrologicheskiy s"yezd, 3rd, Leningrad, 1957.

Trudy...t. III: Sektsiya gidrofiziki (Transactions of the 3rd All-Union Hydrological Convention. v. 3: Hydrophysics Section) Leningrad, Gidrometeoizdat, 1959. 470 p. Errata slip inserted. 2,000 copies printed.

Sponsoring agency: Glavnoye upravleniye gidrometeorologicheskoy sluzhby pri Sovete Ministrov SSSR.

Resp. Ed.: V.A. Uryvayev; Ed.: V.S. Protopopov; Tech. Ed.: M.I. Braynina.

PURPOSE: This work is intended for meteorologists, hydrologists, and hydrophysicists, particularly those engaged in the study of snow and ice and evaporation processes.

COVERAGE: This book contains papers on hydrophysics which were presented and discussed at the Third All-Union Hydrological Conference in Leningrad, October 1957. The Conference published 10 volumes on various aspects of hydrology of which this is number 3. The editorial board in charge of the series include: V.A. Uryvayev (Chairman), O.A. Alekin, Ye.V. Bliznyak (deceased), O.N. Borsuk, M.A. Velikanov, L.K. Davydov, A.P. Domanitskiy, G.P. Kalinin, S.N. Kritskiy, B.I. Kudelin, L.F. Manoim, M.F. Menkel', B.P. Orlov, I. V. Popov, A.K. Proskuryakov, D.L. Sokolovskiy, O.A. Spengler, A.I. Chebotarev, and S.K. Cherkavskiy. This volume is divided into 2 sections: the first contains reports from the subsection for the study of evaporation processes, and the second contains reports from the snow and ice subsection. References accompany each article.

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KONSTANTINOV, A.R., FILATOVA, T.N.

Evaporation from farm fields in the steppe and forest steppe zones of the European part of the U.S.S.R. Trudy GGI no.72:70-101 '59. (MIRA 13:6)
(Evaporation) (Wheat--Water requirements)

KONSTANTINOV, A.R.; PUSHKAREV, V.F.

Observations on evaporation from the surface of water and soil in the U.S.S.R. Mek.probl.meteor. no.1:72-95 '60. (MIRA 13:8)
(Evaporation)

KONSTANTINOV, A.R.; FEDOROVA, T.G.; GOLUBEV, V.S.

Effect of different factors on the readings of water evaporimeters placed in the ground. Trudy GGI no.76:67-111 '60. (MIRA 13:6)

(Evaporation)

KONSTANTINOV, A.R.; FEDOROVA, T.G.

Thermal regime of Lake Valday and distribution of meterological elements over its surface. Trudy GGI no.76:112-151 '60. (MIRA 13:6)

(Valday region--Meteorology)

KONSTANTINOV, A.R.; GOLUBEV, V.S.

Possibility of measuring gradients of atmospheric temperature and humidity by the use of station psychrometers installed in instrument shelters. Trudy GGI no.76:152-167 '60.
(MIRA 13:6)

(Hygrometry)

KONSTANTINOV, A.R.; GOLUBEV, V.S.; POKUDOV, V.V.

Studying the characteristics of air currents determining changes in the evaporation from the surface of a body of water. Trudy GGI no.81:65-90 '60. (MIRA 14:1)

(Valdai, Lake—Evaporation)

KONSTANTINOV, A.R.; FEDOROV, S.I.

Using gradient masts to determine evaporation and heat exchange in forests. Trudy GGI no.81:91-114 '60. (MIRA 14:1)
(Valdai Hills—Meteorology—Observations)
(Forest influences)

KONSTANTINOV, A.R.

Method of determining evaporation from soils, water, and snow by air temperature and humidity measurements made at meteorological stations. Trudy GGI no.81:115-153 '60. (MIRA 14:1)
(Evaporation)

KONSTANTINOV, A.R.

Estimating errors of aspiration and station psychrometers in a thermally inhomogeneous atmosphere. Meteor. i gidrol. no.10:40-45 O '61. (MIRA 14:9)

(Hygrometry)

KONSTANTINOV, A.R.; VORONTSOV, P.A.

Effect of forest belts on winds and turbulent exchange in the atmosphere. Trudy UkrNIGMI no.26:99-110 '61.
(MIRA 15:2)

(Forest influences)
(Winds)

KONSTANTINOV, A.R.

Critical evaluation of methods and apparatus for experimental study of the wind structure. Trudy UkrNIGMI no.26:111-136 '61. (MIRA 15:2)
(Winds)
(Meteorological instruments)

KONSTANTINOV, A.R.

Errors of inertial apparatus measuring the temperature and humidity of the air in a thermally heterogeneous atmosphere. Trudy UkrNIGMI no.26:145-157 '61. (MIRA 15:2)
(Meteorological instruments)

KONSTANTINOV, A.R.; POPOV, O.V.; PUSHKAREV, V.F.

Evaluating methods of determining evaporation and other components of the water balance of farm fields. Trudy UkrNIGMI no.30:19-30 '61. (MIRA 15:1)

(Evaporation)
(Meteorology, Agricultural)

KONSTANTINOV, A.R.

Notes on the technique of measuring evaporation from farm fields. Trudy UkrNIGMI no.30:31-40 '61. (MIRA 15:1)
(Evaporation)
(Meteorology, Agricultural)

KONSTANTINOV, A.R.; KHARCHENKO, K.I.; BARKHATOVA, M.R.; BUROV, V.S.

Investigation of evaporation from farm fields. Trudy GGI no.91:76-109 '61. (MIRA 14:8)
(Evaporation)
(Crops and climate)

S/599/62/000/031/001/006
A066/A126

AUTHOR: Konstantinov, A.R.

TITLE: The principles of the semi-empirical theory by Prandtl and Kármán from the standpoint of the structure of turbulent pulsations in a ground layer of the atmosphere

SOURCE: Kiyev. Ukrainskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut. Trudy, no. 31, 1962. Voprosy fiziki atmosfery, 3 - 16

TEXT: A detailed analysis of the most important characteristics of the turbulence of air-streams, established by the author between 1947 and 1959 by means of anemographs, shows that some propositions of Prandtl's and Kármán's semi-empirical theory are inadequate from the physical point of view. It is pointed out that the commonly accepted opinion that upward vertical pulsations are stronger than downward pulsations is wrong. In the case of an isothermal state and a small vertical equilibrium gradient, downward pulsations are stronger than upward pulsations, but at medium and high vertical equilibrium gradients they

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S/599/62/000/031/002/006
A066/A126

AUTHOR: Konstantinov, A.R.

TITLE: The influence of temperature stratification on intensity of evaporation, turbulent heat transfer, and flow of momentum

SOURCE: Kiyev. Ukrainskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut. Trudy, no. 31, 1962. Voprosy fiziki atmosfery, 17 - 35

TEXT: Shortcomings of Prandtl's and Kármán's semi-empirical theory are eliminated by allowing for the influence exerted by the temperature stratification of the atmosphere and by the forces following from the Archimedean principle on the intensity of vertical turbulent flows of heat, moisture, and momentum. A thorough investigation of turbulent heat transfer is greater than the intensity of heat transfer caused by the gradient of the mean temperatures. The intensities are influenced by the shape of the earth's surface. Bojen's relation is obtained as

$$\frac{P}{LE} \sim 0.62 \frac{\alpha_T}{\alpha_e} \frac{T_p - T}{e_p - e} \frac{P}{1033}, \qquad (25)$$

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KONSTANTINOV, Aleksey Rodionovich; STRUZER, L.R., otv. red.; VLASOVA, Yu.V., red.; ARONS, R.A., tekhn. red.; BRAYNINA, M.I., tekhn. red.

[Evoporation in nature] Isparenie v prirode. Leningrad, Gidrometeorizdat, 1963. 589 p. (MIRA 16:11)
(Evoporation (Meteorology))

KONSTANTINOV, A.R.

Climatological and hydrological research in the People's Republic of Poland. Meteor. i gidrol. no.11:53-54 N '63. (MIRA 16:11)

1. Ukrainskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut.

VITKOVSKIY, B.I.; GOYSA, N.I.; KONSTANTINOV, A.R.; KUDINA, A.V.; OLEYNIK, R.N.; SAKALI, L.I.

Meteorological conditions and heat balance of the underlying surface during the work of the expeditions of the Ukrainian Scientific Research Hydrometeorological Institute and the Main Geophysical Observatory in the summer of 1960 and 1961. Trudy UkrNIGMI no.35:3-17 '63. (MIRA 17:1)

KONSTANTINOV, A.R.; SAKALI, L.I.

Methods for calculating the turbulent heat exchange of the soil surface and the atmosphere based on air temperature and humidity measured at meteorological stations. Trudy UkrNIGMI no.35:18-30 '63. (MIRA 17:1)

KONSTANTINOV, A.R.; GOYSA, N.I.

Methods for calculating the balance of radiation and effective radiation based on the temperature and moisture of the air being measured at meteorological stations. Trudy UkrNIGMI no.35:62-72 '63. (MIRA 17:1)

KONSTANTINOV, A.R.

Methods for calculating the evaporation based on gradient measurement data. Trudy UkrNIGMI no.35:84-108 '63. (MIRA 17:1)

KONSTANTINOV, A.R.; OLYNIK, R.N.

Evaporation from the waste land of the Ukrainian steppes in the summer. Trudy UkrNIGMI no.35:109-115 '63. (MIRA 17:1)

KONSTANTINOV, A.R.; KUDINA, A.V.; OLEYNIK, R.N.

Method for taking into account the effect of the sea on the temperature and moisture of the air above land. Trudy UkrNIGMI no.35:140-152 '63. (MIRA 17:1)

ACCESSION NR: AT4018982 S/2599/63/000/036/0003/0013

AUTHOR: Konstantinov, A. R.

TITLE: Vertical profiles of meteorological elements in the lowest layer of the atmosphere and the concept of the displacement layer

SOURCE: Kiev. Ukr. n.-i. gidrometeor. institut. Trudy*, no. 36, 1963. Voprosy* fiziki atmosfery* (Problems in atmospheric physics), 3-13

TOPIC TAGS: meteorology, displacement layer, air temperature, wind velocity, atmospheric surface layer, atmospheric stratification, meteorological profile, agricultural meteorology

ABSTRACT: On the basis of an experimental investigation of vertical profiles of meteorological elements in the surface layer it is demonstrated that the generalized logarithmic law is not satisfied under natural conditions. A method is described for determination of the height of the displacement layer and experimental data are cited on the height of this layer over a meadow, grain crops and forest. Because of the defects in the generalized logarithmic law and the generalized power law, and since theoretical solution of the problem is difficult, the author has developed his own system based on the stability of temperature stratification of the atmosphere. It is noted that particular attention must be given to a study

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ACCESSION NR: AT4018982

of the difference between the true derivatives of meteorological elements for a particular temperature stratification and the derivatives computed by the simple logarithmic law; a correction factor γ is supplied. Fig. 1 of the Enclosure shows various values of this correction factor as a function of stability of stratification and height above the earth's surface. In the range of ordinarily observed Richardson numbers from 0.2 to -0.3 the value γ at a height of 1 meter varies from 1.1 to 0.86, so that it can be assumed that γ = 1 for computations not requiring great accuracy. Over a tall and dense grain field an air current rises, pushed upward by the grain, as shown in Fig. 2 of the Enclosure. The height of the layer to whose upper boundary the air current is raised has been called the "displacement layer" by certain Soviet meteorologists and is denoted z_{dis}. The methods for determination of z_{dis} at the time of equilibrium stratification are described; the importance of the concept in agricultural meteorology is discussed. Formulas are derived for computation of the gradients of wind velocity, temperature and humidity over a tall field of grain in a temperature-nonhomogeneous atmosphere. Methods and instruments for field observation of these parameters are described. Results of a comparison of experimental wind velocity data and the values of the displacement and roughness layers computed from them indicate a considerable dependence of these parameters on wind velocity, as shown in Fig. 3 of the Enclosure. Orig. art. has: 9 formulas, 5 figures and 1 table.

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ACCESSION NR: AT4018983 S/2599/63/000/036/0014/0022

AUTHOR: Konstantinov, A. R.

TITLE: Investigation of the relationship between the profiles of meteorological elements and characteristics of the underlying surface

SOURCE: Kiev. Ukr. n.-i. gidrometeor. institut. Trudy*, no. 36, 1963. Voprosy* fiziki atmosfery* (Problems in atmospheric physics), 14-22

TOPIC TAGS: meteorology, meteorological profile, air temperature, air humidity, wind velocity, atmospheric stratification, atmospheric roughness layer

ABSTRACT: Experimental data are presented which characterize the dependence of the height of the roughness layer over different types of underlying surface on wind velocity and the stability of atmospheric stratification. The author empirically establishes a universal relationship between the temperature and humidity of the air directly in contact with the surface and determines the values of these elements at the upper boundary of the roughness layer and at a level of 2 meters above the earth's surface. The formula is given for determination of the height of the roughness layer, characterized by the roughness parameter z_0. It is demonstrated that by knowing the value z_0 it is possible to determine the values of temperature T_0 and air humidity e_0 when $z = z_0$ by extrapolation of

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the temperature and humidity values from the above-lying levels to the upper boundary of the roughness layer. Extrapolation of the values of temperature and air humidity, measured at the heights $z_1 = 0.2$ and $z_2 = 2.0$ m to the level $z = z_0$, for example, is accomplished using the formulas:

$$\left.\begin{aligned} T_0 &= T_{2.0} + (T_{0.2} - T_{2.0}) \lg \frac{200}{z_0} \\ e_0 &= e_{2.0} + (e_{0.2} - e_{2.0}) \lg \frac{200}{z_0} \end{aligned}\right\} \quad (1)$$

The values T_0 and e_0 can be determined from the known temperature of the surface and the temperature $T_{2.0}$ and air humidity $e_{2.0}$ (at the height 2m) using the relations:

$$\left.\begin{aligned} T_0 - T_{2.0} &= m_T (T_s - T_{2.0}) \\ e_0 - e_{2.0} &= m_e (e_s - e_{2.0}) \end{aligned}\right\} \quad (2)$$

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where m_T and m_e are empirical coefficients whose numerical values can be determined from gradient measurement data using the formulas:

$$\left.\begin{aligned} m_T &= \lg\frac{200}{z_0}\,\frac{T_{0.2}-T_{2.0}}{T_n-T_{2.0}} \\ m_e &= \lg\frac{200}{z_0}\,\frac{e_{0.2}-e_{2.0}}{e_n-e_{2.0}} \end{aligned}\right\} \qquad (3)$$

In the case of an unstable stratification of the atmosphere there is a decrease of the parameter z_0 (Fig. 1 of the Enclosure), leading to an increase in the values T_0 and e_0 and an increase in the differences $T_0 - T_{2.0}$ and $e_0 - e_{2.0}$. The values of the roughness parameter over soil and snow, computed using the logarithmic law, decrease with an increase in velocity (Fig. 2 of the Enclosure). Profiles of meteorological elements are described well by the generalized power law only beginning at a height of 60-90 cm; below this level the curvature of the actual profiles of meteorological elements changes sign (Fig. 3 of the Enclosure). Orig. art. has: 4 formulas, 5 figures and 2 tables.

ASSOCIATION: Ukrainskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut (Ukrainian Hydrometeorological Scientific Research Institute)

KONSTANTINOV, A.R.

Evaporation regime from the surface of ponds and reservoirs.
Trudy UkrNIGMI no.39:78-89 '63. (MIRA 16:7)

(Evaporation)